Illinois Department of PUBLIC HEALTH

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Trends in Methicillin-resistant *Staphylococcus aureus* (MRSA) in Illinois based on Hospital Discharge Data, 2009-2012

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a type of bacteria that is resistant to certain antibiotics. MRSA usually causes infections of the skin, but also can occur in other tissues and organs of the body, with serious complications. The bacteria can spread among people through direct contact with a person's infected area, sharing of towels or razors that have come in contact with an infection, or from touching surfaces that have been contaminated by an infection. The infection can be difficult to treat due to its resistance to certain antibiotics.

This section presents information about MRSA from the Illinois Hospital Discharge Dataset for 2012. The Hospital Discharge Dataset identifies hospitalized patients with MRSA infections that are acquired in the community, as well as infections acquired during hospitalization. The primary utility of the dataset is to follow overall trends in the burden of MRSA in Illinois hospitals. These data are routinely collected and provided to the Illinois Department of Public Health for all acute care hospitals in Illinois. The unit of analysis is the hospital discharge, not the person or patient.

The data presented in this section should be interpreted with caution. Hospital discharge data are collected for billing, rather than disease surveillance. A 2007 study in an Illinois hospital found that only 31 percent of confirmed MRSA cases were identified using the first nine diagnosis codes from the Hospital Discharge Dataset (Schaefer, SHEA Annual Scientific Meeting, 2008). In 2012, 25 diagnosis codes were available to the Illinois Department of Public Health. We expect that some cases will be missed by this data source, and the analysis will not reflect those cases.

In previous years, the ICD-9 diagnosis code V09.0 (Infection with microorganisms resistant to penicillins) was used to select cases for the Department's annual MRSA report. However, in 2008, new codes were added for MRSA infection and colonization. This report of 2012 data is the third report of Illinois data to use the new codes listed here:

- 038.12 – MRSA septicemia
- 041.12 – MRSA in conditions classified elsewhere and of unspecified site (MRSA other infection)
- 482.42 – Pneumonia due to MRSA (MRSA pneumonia)
- V02.54 – Carrier or suspected carrier of MRSA

Because of the change in coding, only comparisons with 2009 are made in this report. For more information on MRSA in Illinois hospitals during 2002-2008, see 2008's report (MRSA in Illinois Hospitals, 2008).

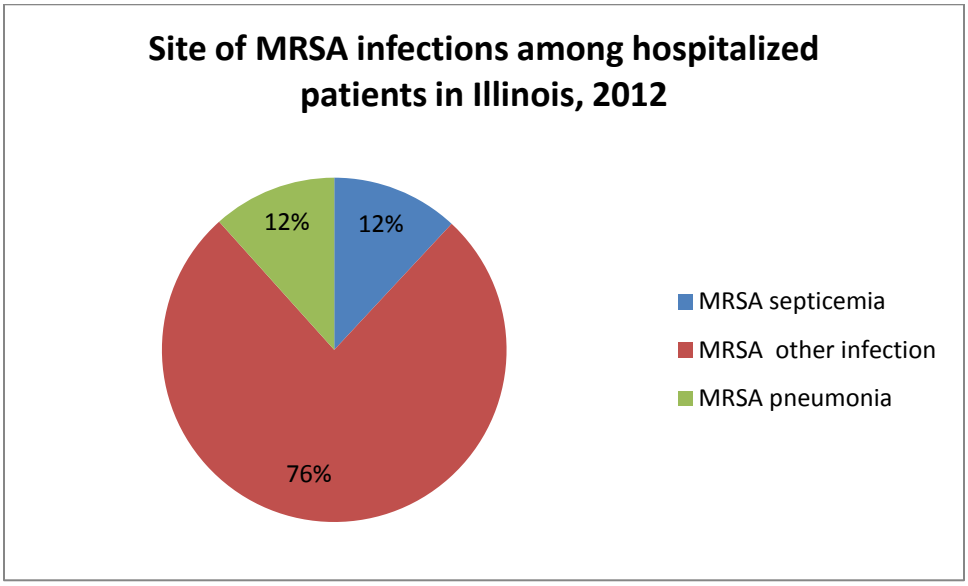
MRSA Infections

The rate of MRSA infections is calculated by dividing the number of MRSA cases in a given year by the total number of discharges for that year. Discharges for which the carrier code (V02.54) is the only code for MRSA are not included in this section.

During 2012, there were 22,301MRSA infections among 1,571,693 discharges, or 14.2 MRSA infections per 1,000 discharges; 1.4 percent of all hospital discharges had diagnosis codes indicating MRSA infection. This is comparable to the following rates of MRSA infections (per 1,000 discharges): 10.7 in 2011, 11.6 in 2010, and 11.7 in 2009 .

The majority of these infections (76 percent) were coded as MRSA other infection (041.12); 12 percent were coded as MRSA septicemia and 12 percent as MRSA pneumonia (Figure 1).

Figure 1. Site of MRSA infections among hospitalized patients in Illinois, 2012



Tables 1 and 2 show the sex and age distribution of patients with hospital discharges coded for MRSA infection in Illinois in 2012. Slightly more than half of infections occurred in men, and 75 percent of infections occurred in individuals aged 50 years and older.

Table 1. Sex distribution of MRSA infections among hospitalized patients in Illinois, 2012

Sex	N	Percent
Female	10736	48.14
Male	11564	51.85

Table 2. Age distribution of MRSA infections among hospitalized patients in Illinois, 2012

Age range (years)	N	Percent
0-4	693	3.11
5-17	321	1.44
18-34	1829	8.20
35-49	2819	12.64
50-64	5385	24.15
65 and older	11254	50.46

Beginning in 2008, twenty-five diagnosis codes were available to IDPH for each discharge. This report uses all 25 codes; reports of data collected before 2008 use only 9 codes.

Conclusions

This report summarizes information about MRSA in Illinois hospitals during 2012. The burden of MRSA in Illinois hospitals is substantial. While data generated from the Illinois Hospital Discharge Dataset should be interpreted with caution, these findings highlight the importance of devoting resources to infection control and prevention activities aimed at decreasing transmission of MRSA in hospitals.

To have a better understanding of the burden of MRSA in Illinois hospitals, it is necessary to distinguish between health care-facility onset and community-onset cases. Historically, discharge data have not been able to discern where a disease or condition was acquired. Beginning in 2008, hospitals were required to include a present on admission (POA) code with each diagnostic code. The mandated use of this code, which indicates whether each diagnosis occurred before or after hospital admission, was part of the Centers for Medicare and Medicaid Services' (CMS) Hospital-Acquired Conditions Initiative, in which CMS would no longer pay hospitals for treatment of specific complications patients developed after admission.

Because the implementation of the POA code was part of a quality improvement strategy explicitly linking payment with healthcare outcomes, its use in epidemiological studies has not been explored. No published studies have evaluated the validity of the POA variable in hospital discharge data with respect to health care-associated infections such as C. *difficile* and MRSA.

Reliance on administrative databases, such as the Illinois Hospital Discharge Dataset, to assess trends in health care-associated infections, detect outbreaks, and provide inter-facility comparisons is not ideal. Further study will be required to validate the POA coding. A personal health care identification number would facilitate linkage of medical records over time and across facilities – in both acute and long-term care. This would help identify previous health care exposures and track infections.

As of January 2012, Illinois hospitals began to monitor *C. difficile* and Methicillin-resistant *Staphylococcus aureus* (MRSA) using the Centers for Disease Control and Prevention National Healthcare Safety Network surveillance system. This surveillance system provides data that is based on laboratory data about MRSA testing rather than diagnosis codes. This more specific information can be used to help prioritize targeted infection prevention and hospital quality improvement programs.